

## REMARKS

### Previously Filed IDS

The Office Action is in response to the Amendment filed 21 September 2004, which was the Amendment dated September 17, 2004. Applicant had also filed an IDS dated September 17, 2004, with the Amendment. However, Applicant did not receive an initialed copy of PTO/SB/08A with the Office Action, indicating that the references in the IDS had been considered. Attached to this Amendment is another copy of the above form, and an initialed copy is requested.

### Rejections Under 35 USC §102 and 35 USC §103

Claims 47-61 and 63-67 have been rejected under 35 USC §102(b) as being anticipated by Bergeron et al (US Patent No. 5,517,127).

Claim 62 has been rejected under 35 USC §103(a) as being unpatentable over Bergeron et al. in view of the Admitted Prior Art.

The rejections under 35 USC §102(b) and 35 USC §103(a) are traversed for the reasons to follow.

### Summary of the Invention

Claims 47-67 are directed to a semiconductor component 50 (Figure 2B). As shown in Figure 2B, the component 50 includes a semiconductor die 54 having die contacts 62, such as bond pads, and an electrically insulating die passivation layer 76. The component 50 also includes a plurality of redistribution conductors 66 on the die passivation layer 76 configured to redistribute the pattern of the die contacts 62 into an area array, such as a grid array. In addition, the redistribution conductors 66 can

either "fan out" or "fan in" the pattern of the die contact 62.

The component 50 also includes an electrically insulating outer passivation layer 78 having openings 82 aligned with selected portions of the conductors 76. The openings 82, and the selected portions of the conductors 76, are arranged in the area array provided by the redistribution conductors 66. The component 50 also includes a plurality of bumped contacts 58 (first contacts) in the openings 82 in the outer passivation layer 78 bonded to the selected portions of the redistribution conductors 66.

The component 50 can also include test contacts 60 (second contacts) comprising selected portions of the redistribution conductors 66 aligned with second openings 80 in the outer passivation layer 78. In addition, the test contacts 60 (second contacts) can also include conductive pads 94 (Figure 3C) made of a non oxidizing metal, such as Au or Pt. The component 50 can also include under bump metallization layers 44 (Figure 1B) configured to facilitate bonding of the bumped contacts 58 (first contacts) to the redistribution conductors 66.

### 35 USC §102 Rejections Of Claims 47-61 and 63-67 Over Bergeron et al.

A proper 35 USC §102 rejection requires that each and every limitation of the claimed invention be disclosed in a single prior art reference. In addition, the reference must be enabling and describe the applicant's claimed invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention. In re David C. Paulsen, 30 F.3d 1475, 31 USPQ 2d (BNA) 1671, (U.S. App 1994).

The 35 USC §102 rejections over Bergeron et al. are traversed, as this reference does not teach or enable all of the features of the presently claimed semiconductor component. However, each of the independent claims has been amended to include additional recitations which emphasize the features which distinguish the presently claimed semiconductor component from the prior art.

A first distinguishing feature of the presently claimed semiconductor component is that it is a "flip chip" component (page 6, lines 27-28 of the specification) configured for "flip chip bonding" to a supporting substrate (page 13, lines 3-6 of the specification). In order to emphasize this feature, independent claims 47 and 54, and dependent claims 59 and 65, have been amended to state that the first contacts (bumped contacts 58-Figure 2B) are "configured for flip chip mounting the component to a supporting substrate". Antecedent basis for this recitation is contained on page 13, lines 3-6 of the specification.

In contrast, Bergeron et al. is directed to a wire bond die (abstract line 2, and column 3, line 59) rather than a flip chip component. In Bergeron et al. the test protrusions 20 are configured for connection to an external testing connector (column 6, lines 6-8). However, there is no disclosure that the test protrusions 20 are configured for flip chip bonding. In addition, the test protrusions 20 would not inherently perform this function, even if they are made of solder. Rather the test protrusions are configured for only a test function, and do not appear to have a function following testing.

A second distinguishing feature of the presently claimed semiconductor component is that the second contacts

(test contacts 60-Figure 2B) are configured for electrical contact by a test probe. There are thus two sets of contacts: the first contacts (bumped contacts 58-Figure 2B) are for flip chip bonding (or function as terminal contacts as will be further explained), and the second contacts (test contacts 60-Figure 2B) are for testing.

In contrast, in Bergeron et al. the test protrusions 20 are configured for testing, but there is thus no suggestion of separate test contacts in combination with flip chip bonding contacts. The rejections are based on the premise that the test protrusions 20 in Bergeron et al. can be used as the terminal contacts for the component, while the wire bond pads 28 can be used for testing. However, the purpose of the test structure 11 is to prevent physical contact with the wire bond pads (column 3, lines 49-51). Thus if the test protrusions 20 are to be used as terminal contacts, there are no separate test contacts.

A third distinguishing feature of the present semiconductor component is that a redistribution circuit includes the first contacts (bumped contacts 58-Figure 2B) and the second contact (test contacts 60-Figure 2B) in combination. Admittedly, redistribution circuits are known in the art. However, the concept of a redistribution circuit which includes both flip chip contacts (or terminal contacts), and test contacts, is submitted to be novel and unobvious over the art.

To emphasize this feature, each of the independent claims has been amended to recite "a redistribution circuit", and has been formatted such that that the conductors, the first contacts and the second contacts are elements of the redistribution circuit. Antecedent basis for these recitations is contained on page 10, line 30, to

page 11, line 2, of the specification. In Bergeron et al. there is no redistribution circuit, but rather merely test structures 11 having wire bond pads 28, test protrusions 20 and conductive straps 16.

Although it can be argued that the conductive straps 16 in Bergeron et al. redistribute the pattern of the wire bond pads 28, the conductive straps 16 are not part of a redistribution circuit as presently claimed. In this regard, redistribution circuits have a particular meaning in the art, and the present claims should be interpreted in light of this meaning. As stated on page 3, lines 18-21 of the present specification: "Redistribution circuits are typically used in semiconductor manufacture to "fan out" the signals from standard wire bond pads, to pads of a dense area array, such as a ball grid array (BGA)."

The conductive straps 16 in Bergeron et al. do not form a redistribution circuit as presently claimed, because they are only used for testing. Following testing, they are not part of the signal transmission system for the die. Amended independent claims 58 and 63 also state that the redistribution circuit includes "terminal contacts" in combination with test contacts. In Bergeron et al. the test protrusions 20 do not function as the terminal contacts for the die, but only as test contacts.

A fourth distinguishing feature of the present semiconductor component is that the second contacts (test contacts 60-Figure 2B) can be aligned with the die contacts 62 (Figure 2B). This permits the component to be tested using an interconnect that is also configured to test the bare die (page 7, lines 12-15 of the specification). Independent claim 63 has been amended to recite this feature. In Bergeron et al., the test protrusions 20 are

meant for connection with a testing connector, but they do not align with the wire bond pads 28.

A fifth distinguishing feature recited in independent claim 58 is that the conductors are "configured for signal transmission in the component and to redistribute a pattern of the die contacts". Antecedent basis for this recitation is contained on page 3, lines 18-21 of the specification. Independent claim 58 also recites that the test contacts comprise "non-oxidizing layers on portions of the conductors". The conductors are thus configured to perform multiple purposes including: redistribution, signal transmission in the component, and oxidation resistant testing. Admittedly, Bergeron et al. teaches that the test protrusions 20 can comprise gold bumps on the conductive straps 16 (column 5, lines 66-67). However, the conductive straps 16 are not configured to perform the additional functions of redistribution and signal transmission in the completed component.

#### 35 USC §103 Rejection Of Claim 62 Over Bergeron et al. and admitted art

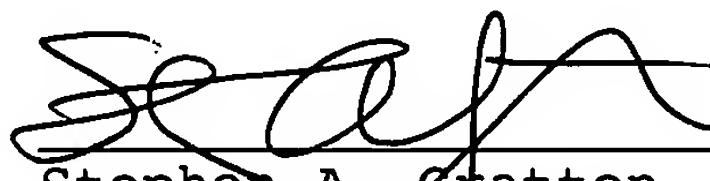
Claim 62 recites that "the test contacts are configured for electrical engagement by a test probe comprising a needle probe, a buckle beam probe, a spring segment probe or a silicon probe." Admittedly this type of probe is known in the art. However, the combination of Bergeron et al. and the admitted art does not include the above noted features of independent claim 58 from which claim 62 depends.

Conclusion

In view of the amendments and arguments, favorable consideration and allowance of claims 47-67 is requested. Should any issues remain, the Examiner is requested to contact the undersigned by telephone.

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March 22, 2005

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